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09/517,589	03/03/2000	Masami Hatori	Q56793	5455

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EXAMINER	
RODRIGUEZ, ARMANDO	
ART UNIT	**PAPER NUMBER**
2828	

DATE MAILED: 05/24/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/517,589	Applicant(s) HATORI ET AL.	
	Examin r Armando Rodriguez	Art Unit 2828	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 March 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-34* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-13 and 15-34* is/are rejected.

7)☒ Claim(s) *14* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

Applicant's arguments filed March 1, 2004 have been fully considered but they are not persuasive.

Regarding applicant's arguments on page 11 pertaining to the 35 USC 112 rejection of claim 24, where applicant's discuss the recited "single peak spatial mode " as being well known in the art, therefore the rejection of claim 24 is withdrawn.

Regarding applicant's arguments on pages 12 and 13 pertaining to the 35 USC 102 (b) rejection of claims 1,3,7,18-24,29-31, where discusses impermissible combination of different embodiments within the cited reference of Yamamoto et al are persuasive, therefore the rejection of claims 1,3,7,18-24,29-31 are withdrawn.

However, applicant's arguments on page 13 pertaining to the "bulk-type polarization inversion device" as not being taught or suggested by Yamamoto et al for use within other embodiment is incorrect. Applicant's attention is directed to all embodiments where the reference number for the wavelength-converting device is (22) and in column 14 lines 15-18 suggest the use of the bulk-type polarization inversion device as the light wavelength-converting device.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1,3,10-13,15,18,19,21-32,34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamamoto et al (PN 5,452,312) in view of Sonoda (JP10254001).

Regarding claims 1,3,30,

Figure 9 illustrates a second harmonic generating laser device having a semiconductor laser (21) emitting a fundamental wave (P1), an optical transmitting filter (50) and a light wavelength converting device (22) formed from a substrate having nonlinear optical effects, as shown the filter is located between the laser and the wavelength conversion device. The wavelength conversion device includes a mirror (61) for reflecting the fundamental wavelength, as described in the abstract and column 11 lines 5-37.

Yamamoto et al does not illustrate in figure 9 a bulk-shaped wavelength conversion crystal.

In figure 16 Yamamoto et al illustrates the use of bulk-like wavelength conversion device (22), as described in column 13 lines 45-68 to column 14 lines 1-19.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the second harmonic generating device of figure 9 with the bulk-like wavelength conversion of figure 16 as suggested by Yamamoto et al, because the bulk-like crystal (22) provides easy alignment, as described in column 14 lines 15-18.

Regarding claims 10,11,12,13,

Yamamoto et al in figure 9 illustrates a filter (50) but does not explicitly disclose the filter as a thin film narrow band-pass birefringent filter.

However, the use of narrow band-pass filters in form of thin birefringent filters for wavelength selection is well known in the art as illustrated by Sonoda in figure 11 as element (91).

Regarding claim 15,

Yamamoto et al does not illustrate in figure 9 a bulk-shaped wavelength conversion crystal.

In figure 16 Yamamoto et al illustrates the use of bulk-like wavelength conversion device (22), as described in column 13 lines 45-68 to column 14 lines 1-19. As illustrated layers (3) form a periodic pattern.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the second harmonic generating device of figure 9 with the bulk-like wavelength conversion of figure 16 as suggested by Yamamoto et al, because the bulk-like crystal (22) resembles a bulk grating and provides easy alignment.

Regarding claim 18,

Figure 9 of Yamamoto et al does illustrate a semiconductor laser (21) coupled with the wavelength conversion device (22).

Regarding claim 19,

Figure 9 illustrates a second harmonic generating laser device having a semiconductor laser (21) emitting a fundamental wave (P1), an optical transmitting filter

(50) and a light wavelength converting device (22) formed from a substrate having nonlinear optical effects, as shown the filter is located between the laser and the wavelength conversion device. The wavelength conversion device includes a mirror (61) for reflecting the fundamental wavelength, as described in the abstract and column 11 lines 5-37.

Yamamoto et al does not illustrate in figure 9 a bulk-shaped wavelength conversion crystal.

In figure 16 Yamamoto et al illustrates the use of bulk-like wavelength conversion device (22), as described in column 13 lines 45-68 to column 14 lines 1-19.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the second harmonic generating device of figure 9 with the bulk-like wavelength conversion of figure 16 as suggested by Yamamoto et al, because the bulk-like crystal (22) provides easy alignment, as described in column 14 lines 15-18.

Yamamoto et al in figure 9 illustrates a filter (50) but does not explicitly disclose the filter as a thin film narrow band-pass birefringent filter.

However, the use of narrow band-pass filters for wavelength selection is well known in the art as illustrated by Sonoda in figure 11 as element (91).

Regarding claim 21,

In column 13 lines 45-68 to column 14 lines 1-19, Yamamoto et al discloses a bulk-type wavelength conversion composed of $LiTaO_3$.

Regarding claim 22,29,31,32,

In column 13 lines 45-68 to column 14 lines 1-19, Yamamoto et al discloses a bulk-type wavelength conversion having polarization inversion layers (3), which extend to the end surfaces of the crystal.

Regarding claim 23,

In column 13 lines 45-68, Yamamoto et al discloses using semiconductor laser of 600 mW.

Regarding claim 24,

Applicant's arguments on page 11 describe the single-peak spatial mode, as being well known to one skilled in the art.

Regarding claims 25-27,

In figure 6 Yamamoto et al teaches of a technique to provide light modulation to laser system via the wavelength conversion crystal, as described in column 9 lines 45-55.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the bulk-like wavelength conversion crystal of Yamamoto et al using the teachings of column 9 lines 45-55 because it would allow for light modulation of the bulk-like wavelength conversion crystal.

Regarding claim 28,

In column 1 lines 7-20, Yamamoto et al discloses using the laser device for optical information processing, which requires recording.

Therefore, it would have been obvious to use claimed wavelength conversion device within an optical information system, as suggested by Yamamoto et al.

Regarding claim 34,

Figure 9 of Yamamoto et al does illustrate a structural arrangement for the laser beam emitted from laser (21) as converging on the incident side of the wavelength conversion crystal (22) and diverging as an output beam.

Claims 2-9,16,17,20,33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sonoda (JP10254001) in view of Yamamoto et al.

Regarding claim 2,3,4,33,

In figure 7 Sonoda illustrates a semiconductor laser (10), a wavelength conversion waveguide (15), a filter (14), a beam splitter (82) for separating the beam and a mirror (85) for reflecting the beam and lens (13) and (20) for converging the beam into the wavelength conversion crystal and receiving the emitted diverging beam. The waveguide and the laser form an external resonant cavity by having a high reflective coating, which reflects the laser light and outputs second harmonic light. The band pass filter will provide wavelength selection.

Sonoda is silent as to using a bulk-shaped wavelength conversion crystal.

In figure 16 Yamamoto et al illustrates the use of bulk-like wavelength conversion device (22), as described in column 13 lines 45-68 to column 14 lines 1-19.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the second harmonic generating device of Sonoda in figure 7 with the bulk-like wavelength conversion crystal of figure 16 as suggested by

Yamamoto et al, because the bulk-like crystal (22) provides easy alignment, as described in column 14 lines 15-18..

Regarding claims 5,

In figure 9 Sonoda illustrates a semiconductor laser (10), a wavelength conversion waveguide (15), a filter (14) and a mirror (85) to feedback a backward emitted light to the laser in a direction different than towards the wavelength conversion crystal. The waveguide and the laser form an external resonant cavity by having a high reflective coating, which reflects the laser light and outputs second harmonic light. The band pass filter will provide wavelength selection.

Sonoda is silent as to using a bulk-shaped wavelength conversion crystal.

In figure 16 Yamamoto et al illustrates the use of bulk-like wavelength conversion device (22), as described in column 13 lines 45-68 to column 14 lines 1-19.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the second harmonic generating device of Sonoda in figure 7 with the bulk-like wavelength conversion crystal of figure 16 as suggested by Yamamoto et al, because the bulk-like crystal (22) provides easy alignment, as described in column 14 lines 15-18.

Regarding claims 6,16,17,

In figure 24 Sonoda illustrates a semiconductor laser (10), a wavelength conversion waveguide (15), a lens (40) for collimating the beam into a fiber (23) with grating, which reflects part of the beam and selects the wavelength. The waveguide and

the laser form an external resonant cavity by having a high reflective coating, which reflects the laser light and outputs second harmonic light.

Sonoda is silent as to using a bulk-shaped wavelength conversion crystal.

In figure 16 Yamamoto et al illustrates the use of bulk-like wavelength conversion device (22), as described in column 13 lines 45-68 to column 14 lines 1-19.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the second harmonic generating device of Sonoda in figure 7 with the bulk-like wavelength conversion crystal of figure 16 as suggested by Yamamoto et al, because the bulk-like crystal (22) provides easy alignment, as described in column 14 lines 15-18.

Regarding claim 7,

In figure 17 Sonoda illustrates a semiconductor laser (10), a wavelength conversion waveguide (15), a grating (92), which reflects part of the beam and selects the wavelength and a beam splitter (21). The waveguide and the laser form an external resonant cavity by having a high reflective coating, which reflects the laser light and outputs second harmonic light.

Sonoda is silent as to using a bulk-shaped wavelength conversion crystal.

In figure 16 Yamamoto et al illustrates the use of bulk-like wavelength conversion device (22), as described in column 13 lines 45-68 to column 14 lines 1-19.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the second harmonic generating device of Sonoda in figure 7 with the bulk-like wavelength conversion crystal of figure 16 as suggested by

Yamamoto et al, because the bulk-like crystal (22) provides easy alignment, as described in column 14 lines 15-18.

Regarding claim 8,

Sonoda does illustrate in figure 17 a beam splitter (21), but does not illustrate a light modulation device.

However, in figure 6 Yamamoto et al teaches of a technique to provide light modulation to laser system via the wavelength conversion crystal, as described in column 9 lines 45-55.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the bulk-like wavelength conversion crystal of Yamamoto et al using the teachings of column 9 lines 45-55 because it would allow for light modulation of the bulk-like wavelength conversion crystal.

Regarding claim 9,

In figure 17 Sonoda illustrates a semiconductor laser (10), a wavelength conversion waveguide (15), a grating (92), to feedback a backward emitted light to the laser in a direction different than towards the wavelength conversion crystal and selects the wavelength. The waveguide and the laser form an external resonant cavity by having a high reflective coating, which reflects the laser light and outputs second harmonic light.

Sonoda is silent as to using a bulk-shaped wavelength conversion crystal.

In figure 16 Yamamoto et al illustrates the use of bulk-like wavelength conversion device (22), as described in column 13 lines 45-68 to column 14 lines 1-19.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the second harmonic generating device of Sonoda in figure 7 with the bulk-like wavelength conversion crystal of figure 16 as suggested by Yamamoto et al, because the bulk-like crystal (22) provides easy alignment, as described in column 14 lines 15-18.

Regarding claim 20,

In figure 11 Sonoda illustrates a semiconductor laser (10), a wavelength conversion waveguide (15) and a narrow band-pass filter (91). The waveguide and the laser form an external resonant cavity by having a high reflective coating, which reflects the laser light and outputs second harmonic light.

Sonoda is silent as to using a bulk-shaped wavelength conversion crystal.

In figure 16 Yamamoto et al illustrates the use of bulk-like wavelength conversion device (22), as described in column 13 lines 45-68 to column 14 lines 1-19.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the second harmonic generating device of Sonoda in figure 7 with the bulk-like wavelength conversion crystal of figure 16 as suggested by Yamamoto et al, because the bulk-like crystal (22) provides easy alignment, as described in column 14 lines 15-18.

Allowable Subject Matter

Claim 14 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

None of the cited references discloses the recited structural arrangement of providing on the surface of the reflecting member a thin film narrow band pass filter for wavelength selection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Armando Rodriguez whose telephone number is 571-272-1952. The examiner can normally be reached on flex / M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Don Wong can be reached on 571-272-1834. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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Examiner
Art Unit 2828

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